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ABSTRACT

The behavior of native English speakers and Japanese English as second language (ESL) learners on word association tasks was investigated. Research has shown that Japanese adults respond in Japanese in an identifiably different way than English speaking adults respond in English, and that native English speaking children demonstrate a developmental shift in word association behavior. It was hypothesized, therefore, that ESL learners would acquire English word association behavior as a function of acquiring English language proficiency. In association to nouns, verbs, and adjectives, significant differences were found between beginning ESL learners and native speakers but not between advanced ESL learners and native speakers for adjectives and verbs. No significant differences were found among the groups for nouns. It is concluded that word association behavior shows potential as an indicator of more generalized language proficiency. (Author/RW)

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Word Association Behavior as an Indicator of English Language Proficiency

by

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Abstract

The study reported here examines the behavior of Japanese ESL learners at two levels of English proficiency and native English speakers in word association tasks. Research has shown that Japanese adults respond (in Japanese) in a definably different way from English-speaking adults (in English) and also that native English children demonstrate a developmental shift in word association behavior. It was hypothesized, therefore, that ESL learners would acquire English word association behavior as a function of acquiring proficiency in the English language. Investigating association to nouns, verbs and adjectives, the researchers found significant differences between beginning ESL learners and native speakers but not between advanced ESL learners and native speakers for adjectives and verbs. No significant differences were found among the three groups for nouns. They conclude that word association behavior shows potential as an indicator of more generalized language proficiency.

Word Association Behavior
as an
Indicator of English Language Proficiency

Current research in second language learning and in bilingualism reflects a shift away from the piecemeal analysis of language toward analysis of wholes. Thus interest in, for example, the acquisition of particular sounds or of morphemes, the order of acquisition of grammatical morphemes, and word association behavior, has given way to interest in the processing of larger units - message or discourse processing. On the whole, this shift of focus has been well motivated and can be seen as an indication that second language researchers are beginning to investigate natural language behavior rather than laboratory-induced behavior and are aware that understanding the sum of the parts (even if that were possible) may not contribute greatly to the understanding of the whole, the acquisition or learning of a natural language. Nevertheless, there is a case to be made for certain "discrete" types of research, including word association research.

The case is, very simply, that full competence in a language involves cognitive competence, "The ability to make effective use of the cognitive functions of the language".[1]

That the syntagmatic-paradigmatic shift in native English-speaking children seems to coincide with Piaget's observation of a shift from pre-operation to logical-concrete operations suggests that we take more seriously word association as a line of inquiry.[2] Word association behavior provides clues to the nature of lexical organization and retrieval strategies which will, in turn, contribute to our understanding of the relationship between language and cognition in bilinguals and in developing better techniques for determining degree of language proficiency.

There is a body of research supporting the view that a shift in response mode in word association tasks indicates a major change in cognitive organization, a significant developmental marker in the acquisition of language. Two areas of inquiry are of especial interest to second language acquisition research. The first involves studies of the shift with age in the response modes of children. The second involves studies demonstrating that these later response modes may be culturally influenced.

In general, the response behavior of children has been found to be similar across several languages. While researchers studying English speaking children fail to agree on the exact classification of early heterogeneous responses, there seems to be substantial agreement that there is a signficant increase in paradigmatic responses for verbs and adjectives between kindergarten and grade 6. Noun responses are typically nouns and thus demonstrate no change.[3]

Moran used the terms <u>enactive</u> (a word pair descriptive of action upon the referent, noun-verb or verb-noun, e.g. apple-eat, rip-pants), <u>logical</u> (synonyms, superordinates, contrasts,

or co-ordinates) and iconic (a word pair ascribing a quality to the referent, adjective-noun or noun-adjective) to describe the response behavior of Japanese and American children.[4] He found the early response mode of both groups to be enactive but that the shift was to logical responses by the Americans and to iconic responses by the Japanese. (Note that syntagmatic subsumes enactive, and in some instances, iconic, and paradigmatic subsumes logical. A later study of Mandarin-Chinese children aged four to six revealed an overwhelming preference for responses in the enactive mode.[5] These studies suggest that there may be universal patterns of word association behavior in young children. Other studies add support to the notion that later behavior may be culturally influenced.

Looking at the association behavior of French-Canadian monolinguals and English/French-Canadian bilinguals, Lambert & Moore found that the degree of paradigmaticity of responses was very similar.[6] The primary responses, however, displayed a great deal of diversity in that the bilingual group behaved more like English-Canadians and Americans when responding in English, but more like French-Canadians and French-French when responding in French.

Moran & Huang found that adult Chinese subjects responded in much the same ways as Moran reported for Japanese adults, preferring iconic and enactive modes.[7] In another experiment, Moran & Huang found that English-speaking Chinese college students responded in the logical and iconic modes. This is the same order of responses favored by the American adults in Moran's study,[8] raising the question of whether the difference between the non-English and English-speaking adults was due to the effects of

English language training, to the education process in general, or to a combination of language training and education.

Crable found the number of paradigmatic responses made by foreign (non-American) graduate students to be "significantly less than native born graduate students".[9] Investigating the relationship between paradigmatic responding and verbal intelligence (as measured by the GRE), she found a significant positive correlation which she took as evidence that paradigmatic responding increases with fluency in English.

The effect of education on the incidence of paradigmatic responding was addressed directly by Sharp & Cole.[10] Studying Kpelle-speaking tribesmen of Liberia, they investigated the word associations of educated and uneducated groups at three age levels. While they found a small positive effect of increased age and education on the proportion of paradigmatic responses, they found the effect of education not to be uniform. The investigators also found that with educated subjects who spoke English and Kpelle, older subjects gave more paradigmatic responses than the younger subjects and those responding in English gave more paradigmatic responses than those responding in Kpelle. Their studies suggest a shift in response mode, possibly even characterizable as syntagmatic to paradigmatic, occurring in a language structurally different from any in which the shift had been previously documented.

Crable & Johnson, studying Farsi-English bilinguals, found differences in the paradigmatic thinking patterns of the Farsi speakers related to the language in which they were responding.[11] They speculated that when one language is clearly dominant, differences in association behavior will be exhibited, assuming

that paradigmatic responses are symptomatic of more mature, or superior thinking (an assumption supported by, for example, Jenkins et al.).[12]

There are two strands of research, then, which suggest that word association behavior might provide at least a limited index of a learner's development in his new language. If response behavior for a variety of language groups can be characterized and if it can be established empirically that second language learners adopt the mode of response favored by native speakers of that language, then educators and researchers can begin to examine word association tasks (and even specific words) for their utility in assessing language proficiency. The present study addressed the second condition.

Three hypotheses were tested:

1/ That Japanese adults begining to learn English would give predominantly syntagmatic responses to nouns, verbs, and adjectives in English, and thus differ significantly from native-English speakers;

2/ That advanced Japanese students of English would give fewer syntagmatic responses in English than the beginners and more closely parallel native-English speakers;

3/ That the primary responses of the Japanese advanced group would more closely resemble the native-English responses than would those of the Japanese beginners.

Method

Subjects

Forty undergraduates at the University of British Columbia composed the native-English-speaking sample. Thirty Japanese students enrolled in ESL classes at UBC's Language Institute made up the second-language-learner sample. Half the Japanese students were classified as beginners and half as advanced by a battery of placement tests commonly used at UBC.

Materials

A list of 24 words, eight each of adjectives, nouns, and verbs, was selected from words appearing on one or more of the lists used by Kent-Rosanoff, Deese, Russel & Jenkins, Palermo & Jenkins, Fillenbaum & Jones, Entwisle, and Moran.[13] Half the verbs were transitive; half were intransitive. To reduce ambiguity of form-class (e.g. table can be either a verb or a noun) the intended form-class of each stimulus word was printed at the top of each test sheet.

In order to assure continued association (those successively elicited by the same stimulus), the original stimulus word was written fifteen times down the left side of each page of the test booklet. (Reading and writing from left to right, the subject is more likely to return to the stimulus word after each response than to treat the last response as a stimulus.) The word lists were randomly ordered for each subject.

Procedure

The word association test was administered in two sessions, one for the Japanese and one for the English speakers. Subjects were given both written and oral instructions before the test began. They were given thirty seconds to respond to each new stimulus word after which they were told to proceed to the next page. The experiment continued in this manner through each of the 24 stimulus words.

Scoring

The response data were scored independently by two judges, both graduate linguists. Responses were judged, first, as either paradigmatic or syntagmatic, being labelled as paradigmatic if they belonged to the same form-class as the stimulus word, with the following provisos:

1/ All cases in which the stimulus word was repeated, e.g. rough-rough sea, were counted as syntagmatic;

2/ All cases in which a sequential pattern was obvious were counted as being syntagmatic (even though the nominal form class of stimulus and response were the same e.g. flower-pot, table-cloth).

Responses not belonging to the same form-class as the stimulus word were considered syntagmatic, thus any response to a noun stimulus that was not a noun was considered as a syntagmatic response.

Responses were then re-categorized by the same two judges into the following categories:

Superordinate	e.g. table-furniture
Coordinate	e.g. table - chair
Part	e.g. table - legs
Function	e.g. table - eat
Attribute	e.g. table - rough
Synonym	e.g. bitter - acrid
Contrast	e.g. table - white
Completion	e.g. table - cloth

(Other categories such as substance and location were available to the judges but are excluded here because no responses were so classified.)

In the first procedure, there was 100% agreement between the judges and in the second, 98%. The two per cent of responses on which the judges did not agree were assigned to the "unclassified" category.

Results

Using the mean number of paradigmatic responses in each category as the measure, three one-way, fixed-effect-model analyses of variance were performed on the data with form-class as the independent variable. As shown in Tables 1 - 3, there were significant differences between groups for adjectives and verbs, but not for nouns.

The Scheffé multiple comparison procedure performed on the means (shown in Table 4) revealed that the significant F-ratio was attributable to differences between the native English speakers and the beginning Japanese ESL speakers for both adjectives

Analysis of Variance Summary Tables

Table 1, Verbs

Source	df	SS	MS	F	P(F)
Between Groups	2	2782.66	1390.83	3.683	0.0304
Within Groups	67	25302.85	377.65		
Total	69	28084.51			

Table 2, Adjectives

Source	df	SS	MS	F	P(F)
Between Groups	2	2009.72	1004.86	6.259	0.0032
Within Groups	67	10757.87	160.55		
Total	69	12766.59			

Table 3, Nouns

Source	df	SS	MS	F	P(F)
Between Groups	2	132.91	66.45	0.296	0.7444
Within Groups	67	15018.23	224.15		
Total	69	15151.15			

Table 4

Mean Proportion of Paradigmatic Responses

	Nouns	Verbs	Adjectives
English	.62	.41	.28
Japanese ESL Advanced	.66	.34	.25
Japanese ESL Beginners	.64	.25	.16

and verbs. While no other significant differences were found between means , Table 4 suggests a pattern of increasingly paradigmatic responding with increased proficiency in English, a pattern which might emerge more clearly with larger samples of subjects and lexical items.

These results, then, offer partial support to the first hypothesis. In particular, beginning students of Japanese were found to respond syntagmatically to verbs and adjectives to a significantly greater degree than native English speakers. The hypothesis, however, included nouns and the analysis revealed no differences among the groups for noun stimuli.

The second hypothesis, that advanced ESL students would give fewer syntagmatic responses in English than the beginners and more closely parallel native speakers, received only limited support: The Scheffé procedure revealed no significant difference between responses of native English speakers and advanced ESL learners to any of the form-classes. The expected difference between beginner and advanced ESL students was not found.

The third hypothesis was investigated in two ways. First, the responses were classified in the categories given on page six. Table 5 shows the percentage of responses falling into each category by language group and stimulus form-class. The "unclassified" category included response types such as proper names (infrequent but most commonly given in response to music), rhymes, and metathesized segments (e.g. flutterby in response to butterfly).

The only differences which stand out are in the completion category where the ESL beginners favored completion-type responses to adjectives by a ratio of more than two to one over the advanced

Table 5

Proportion of responses* in each category by form class and language group

Category	Nouns			Adjectives			Verbs		
	English	ESL A	ESL B	English	ESL A	ESL B	English	ESL A	ESL B
Superordinate	___	4%	___	___	4.04%	8%	___	___	___
Coordinate	37.5%	35%	48.0%	___	___	___	___	___	___
Part	12.5%	13%	9.5%	___	___	___	___	___	___
Function	25.0%	17%	9.5%	4.0%	4.0%	___	4%	5%	___
Attribute	___	___	___	___	___	___	___	5%	___
Synonym	12.5%	___	___	8.0%	21%	___	42%	45%	17%
Contrast	___	___	___	29.0%	21%	___	17%	25%	8%
Completion	12.5%	13%	15.0%	42.0%	33%	75%	37%	10%	42%
Unclassified	___	___	9.5%	17.0%	17%	17%	___	10%	33%
N =	24	23	21	24	24	12	24	20	12

*(only the first three responses to each stimulus word are classified here)

ESL learners and by a ratio of slightly less than two to one over the native speakers. For verbs they favored this type of response by a four to one ratio over the advanced ESL learners, but, curiously, differed little from the native speakers. Given that the completion category corresponds to syntagmatic responding and the results of the ANOVA and Scheffé, it is hardly surprising to find a high percentage of beginners' responses in this category. The differences in response made by the beginning Japanse ESL subjects is underscored as well by the relatively large proportion of scores in the "unclassified" category. These scores reflected highly idiosyncratic responses which the judges could not classify according to their established criteria and which may simply represent random behavior or behavior which would be typical if the subjects were responding in Japanese.

As a second way of investigating the third hypothesis, a commonality measure was established. Commonality, here, is defined as the total frequency of the three most popular responses and is calculated by adding the number of first three responses which coincided with the first three responses of the native speakers and dividing by 72 (3 x 24 stimuli = 72 responses).

It was hypothesized that the primary responses of the Japanese advanced students would more closely parallel the primary responses of the native-English group than those of the Japanese beginners. Comparing the native speakers with the advanced ESL learners, an overall commonality score of .47 was obtained, meaning that the first three responses of the two groups coincided almost fifty per cent of the time. Comparing the native-English speakers

with the ESL beginners resulted in an overall commonality score of .26. This means that the responses of the advanced ESL group duplicated those of the native English group nearly twice as often as those of the ESL beginners, lending additional support to hypothesis three. (Table six gives the frequencies of the three most common responses from which the commonality scores were calculated.)

Discussion

The three experimental hypotheses addressed a single, central question. Specifically, do the differences in association behavior between Japanese speakers and English speakers in English word association tasks diminish as the Japanese become more proficient in English? Or, in other words, do the Japanese acquire English response behavior along with ability in the language? The results reported here support a positive answer: There were measurable differences between the response modes of the Japanese ESL beginners and the native speakers but not between the advanced ESL learners and the native speakers, and the primary response data showed that the advanced learners' responses were far more similar to native speakers' than were the beginners'. Assuming that native Japanese response modes differ for native English response modes (as reported by Moran, for example), it seems likely that the dissimilarity between native speakers and Japanese ESL beginners (and the similarity between English speakers and advanced ESL learners) is attributable to the beginners'being influenced by the response mode of their mother culture.

Even though the hypotheses are largely supported, there are aspects of the data which require further consideration. Underlying the experimental hypotheses was the assumption that there is in English a developmental shift from syntagmatic to paradigmatic responses. In the present study, however, the native English speakers responded primarily syntagmatically to verbs and adjectives (see Table 4). While the reasons for this finding are not at all certain, one possibility is methodological.

The figures which suggest that the native speakers did not behave as predicted, i.e., the means in Table 4, are based on the total number of responses made by each subject. If only the first three responses are considered, however, we see a greater tendency of native speakers to respond paradigmatically. Table 5 shows, for example, that 42 per cent of the native English speakers' first three responses to verb stimuli were synonyms. Add to this percentage the 17 per cent of responses which were contrasts and the proportions exactly reverse. That is, where 41 per cent of the total responses to verbs were paradigmatic and 59 per cent syntagmatic, of the the first three responses, 59 per cent were clearly paradigmatic and 41 per cent syntagmatic. It would seem, then, that the preferred response mode for verbs may indeed be paradigmatic, but when subjects are forced to make numerous responses, as they were in this task, they must necessarily look to other form-classes for responses as the number of synonyms and antonyms is more limited than the number of possible subjects, predicates or modifiers.

This explanation of subjects' behavior cannot be invoked in the case of adjectives. Here we find the proportion of paradigmatic responses for the total number of responses only slightly less than that for the first three, 28 per cent versus 34 per cent, if we consider synonyms and contrast once again as indicators of paradigmaticity. At this point it seems possible to conclude only that adults may respond differently to verb and adjective stimuli, that categories as broad as paradigmatic and syntagmatic may obscure the real nature of subjects' behavior, and (as always) that more research is needed with larger samples of words.

Whatever the reasons, the native speakers' preferences for syntagmatic responses complicates somewhat the interpretation of the data for the ESL beginners who also responded primarily in the syntagmatic mode. In other words, while there were statistically significant differences in the degree of paradigmatic responding between the two groups, it is nevertheless the case that both groups preferred syntagmatic responses. For the Japanese ESL beginners, this preference might be attributable to the influence of their native response patterns. Or it could be that they are exhibiting the type of response behavior typical of English-speaking children and thus truly paralleling the developmental shift so widely reported for native English speakers.

The data show that the advanced ESL group responds in a mode not statistically distinguishable from that of native English speakers, a finding which lends more support to the claim of a developmental trend toward paradigmatic responding. The problem remains, however, of how to interpret the syntagmatic responding

to verbs and adjectives by the beginners. The noun data offer a clue. For the Japanese ESL beginners, 64 per cent of the responses to nouns were paradigmatic compared to 62 per cent and 66 per cent for the native English and Japanese advanced ESL groups respectively. To nouns, then, the beginners are clearly responding in a manner different from that reported for associative responses in Japanese by Moran. If the Japanese beginners are, in fact, being influenced by their native tongue, then we would expect that nouns, as well as verbs and adjectives, would elicit syntagmatic responses. That this was not the case suggests that the syntagmatic responses of Japanese beginners to verb and and adjective stimuli reflected a developmental pattern similar to that exhibited by native English speakers: There is little reason to assume that subjects would change their response pattern parameters. Assuming this to be so, two conclusions may be stated based on the discussion so far. First, Japanese ESL students, at least for verbs and adjectives, undergo a shift toward paradigmatic responding on a word-association test that parallels English native-speaker development. Second, it would appear that Japanese ESL students do not revert to their native-tongue vocabulary storage system for vocabulary items they need in English.

While the study reported here raises some questions about response behavior of both native speakers and ESL learners, it also supports the observation that ESL learners adopt the mode of response favored by native English speakers. Clearly, more research is needed before we can consider any pedagogical application. The results of the present study seem to justify such endeavour.

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